TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION
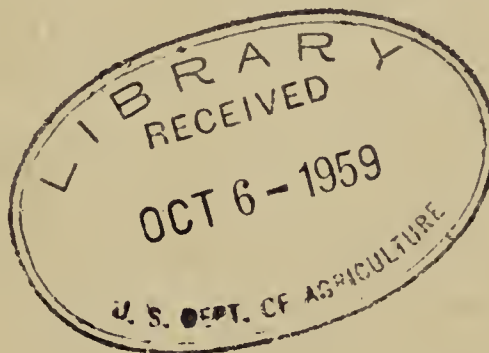## UNIVERSITY FARM ST. PAUL I, MINNESOTA

No. 291

Time Required to Cut Black Spruce Trees

The introduction of mechanized equipment into the felling and bucking operations of pulpwood logging often calls for a time comparison of power-tool cutting with hand methods to determine which is more economical. For this purpose it is necessary to know how much time is needed in hand-cutting trees of various sizes. Such information was obtained by time and motion studies made in connection with a black spruce pulpwood utilization project carried out near Big Falls, Minnesota, by the Minnesota Division of Forestry, the Minnesota and Ontario Paper Company, and the Lake States Forest Experiment Station.

The cutting operation consisted of felling the tree, bucking it up into 8-foot sticks at the point of felling, lopping the slash to lie close to the ground, cutting skid-trail, and piling the wood in small piles along the skid-trail. Cutters worked singly.

By applying the figures from the following table to a stand table for the area to be cut, an estimate can be made of the time required for the hand-cutting operation.

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Time Required in Cutting Black Spruce Trees of Various Diameters to Three Top Utilization Standards

Activity	Top Utilization	Breast high diameter of trees						
		4"	5"	6"	7"	8"	9"	10"
	Inches	Time in seconds						
Felling	2½	54	75	100	128	160	192	246
	3	54	75	100	128	160	192	246
	4	54	75	100	128	160	192	246
Bucking	2½	76	112	155	205	260	320	385
	3	62	96	140	190	240	300	355
	4	44	80	120	170	220	270	325
Limbing	2½	24	50	85	135	185	230	270
	3	14	40	75	125	170	210	240
	4	–	14	45	85	125	160	185
Lopping	2½	25	30	35	38	35	35	30
	3	39	40	42	42	40	40	35
	4	58	65	68	70	68	64	60
Piling	2½	39	62	88	115	144	174	204
	3	32	56	82	110	138	166	196
	4	20	42	70	95	124	152	184
Miscellaneous	2½	84	84	84	84	84	84	84
	3	84	84	84	84	84	84	84
	4	84	84	84	84	84	84	84
Total	2½	302	413	547	705	868	1,035	1,219
	3	285	391	523	679	832	992	1,156
	4	260	360	487	632	781	922	1,084

	Basis – Number of Trees							
	2½	34	83	112	82	50	22	3
	3	55	85	99	96	48	12	1
	4	8	74	105	116	59	21	11